June Hornby

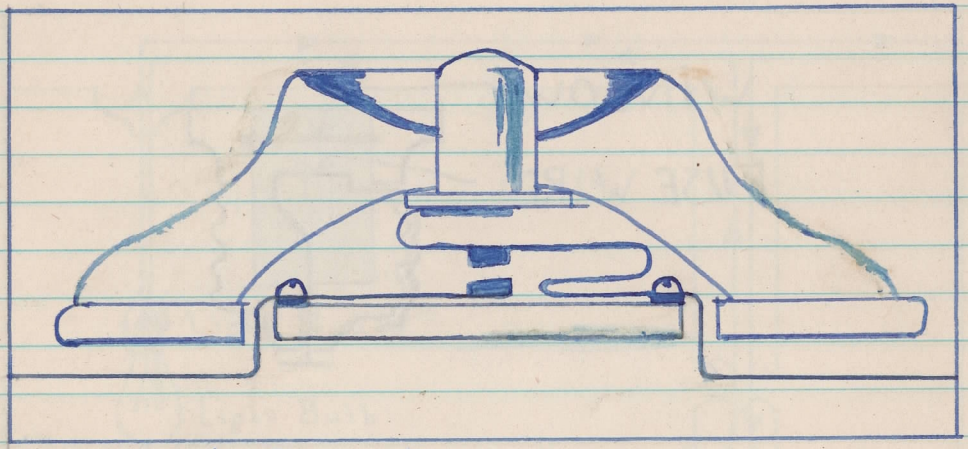
SCIENCE

COLLEGIATE

GENUINE PRESSBOARD

W-1630-10

9th grade at Everett Jr. High, Lincoln, Nebraska



A Push-Button

1. Something to start it.
2. Something to stop it.
3. Something for it to flow through
4. Something to guide it.

II Four Parts of the Circuit

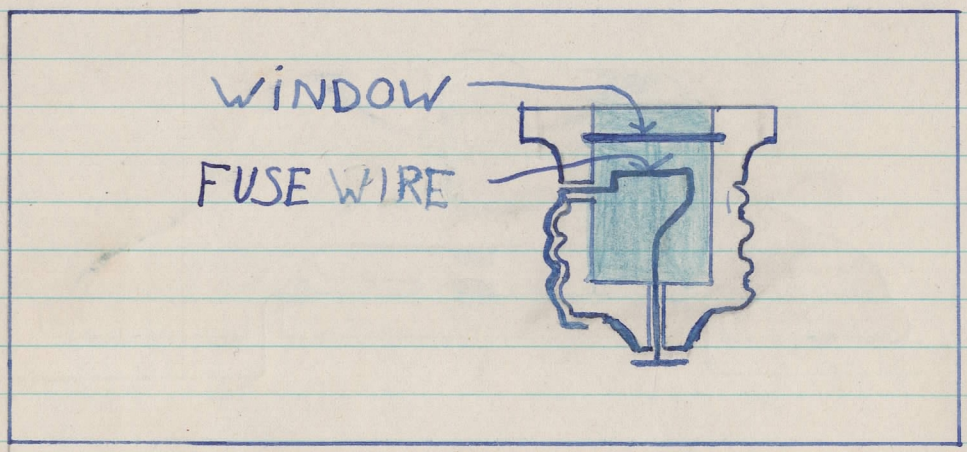
1. Something that makes it.
2. Something to carry it from that
3. Something to start and stop it.
4. Something to use it.

III In Our Home

1. Switches start and stop it.
2. Wires to carry it
3. Appliances to use it.
4. A generator to make it.

IV Fuse Plugs

1. Electrons are running along the wire.
2. Fuse plugs keep too many from

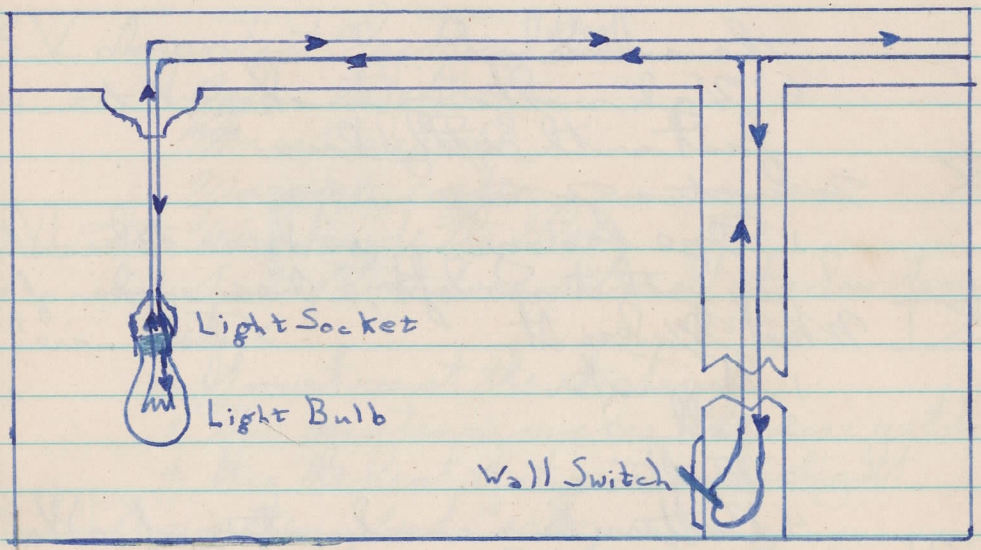


A FUse Plug

coming in.
3. When too many come in, the wires get hot.
4. In the fuse plug is a little piece of metal
5. this melts at a low temperature.
6. this breaks the current.
7. A penny can be put in for a plug.
8. This is very unsafe.
9. It will stand as much heat as the copper wire

V New Fuse Plugs
1. Has a little switch
2. This flies open when too many electrons are passing.

VI ~~Things~~ Things that will Cause too Many Electrons
1. Too many things plugged on.
2. A short will cause too many to flow.



Light Connected In Series

VII What is a Short?

1. We do not have anything using them when two wires touch.
2. This allows them to flow too fast.

VIII Passing Out of the Wires

1. Covered by insulation.
2. Rubber
3. Cotton top.
4. Glass is used.

IX Voltage

1. It is the pressure of electrons.
2. They can run 30,000 volts.
3. For home use is 110 volts.
4. It is stepped down by transformers.
5. The big lines must carry enough for

the whole city.
6. High voltage makes it travel fast with little loss

X Why two wires
1. One brings in and one takes out any that are left. 2. One is spoken of as a 'live wire'.

XI What Makes It
1. Generator
2. Cell.
3. Batteries
4. Battery is a combination of cells.

XII Motor and a Generator.
1. A generator makes it.
2. Motor uses it.

XIII Neon Signs
1. They get their names from a gas.
2. The different color means a different gas in the tube.
3. Electric current lights gas.
4. Red is the cheaper one.
5. A transformer brings the voltage to 1,000 for them.

XIV Newest Kinds of Lamp
1. Fluorescent
2. They are a cooler light.
3. They are a better light.
4. It's a light that glows.
5. Does not require heat

XV Important Electrical Men

1. Bell; telephone
   Morse; telegraph
   Marconi; radio

XVI The Wire Inside the Globe

1. A wire that does not melt at a low temperature
2. It must resist the electrons.
3. This resistance makes the wire get hot.
4. It is the heat that gives the light.

XVII Tungsten and Carbon

1. Tungsten; 3100° C.; it melts
2. Carbon; 1850°; it melts.
3. Carbon; 1% light, 99% heat.
4. Tungsten; 3% more light.

UNIT IV

HOW HAS MAN GAINED CONTROL OVER THE ENERGY RESOURCES OF THE EARTH?

SOUND

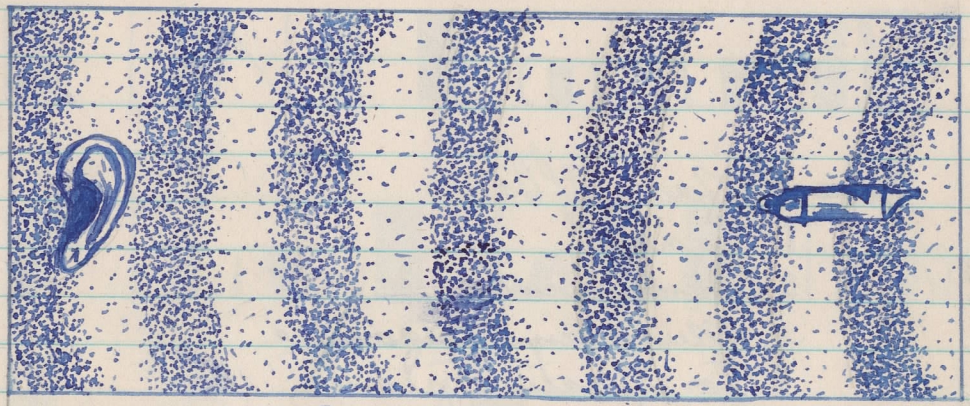
I Uses Made of It
1. Signals
2. Communicate
3. Music and pleasure
4. For locating planes
5. Safety
6. Can help the blind walk.
7. To test machinery
8. For fighting subs.

II How Valuable
1. We cannot estimate the value.

III the Problem
1. It is to control it.

IV How We Control It
1. Loud speakers
2. Some walls in the room are fixed for taking sound.
3. Speaking tubes
4. Ear-phones
5. By electricity
6. Dial
7. Heavy hangings.

V How the Waves travel.
1. In all directions.
2. They travel by waves.



How Sound Is Carried

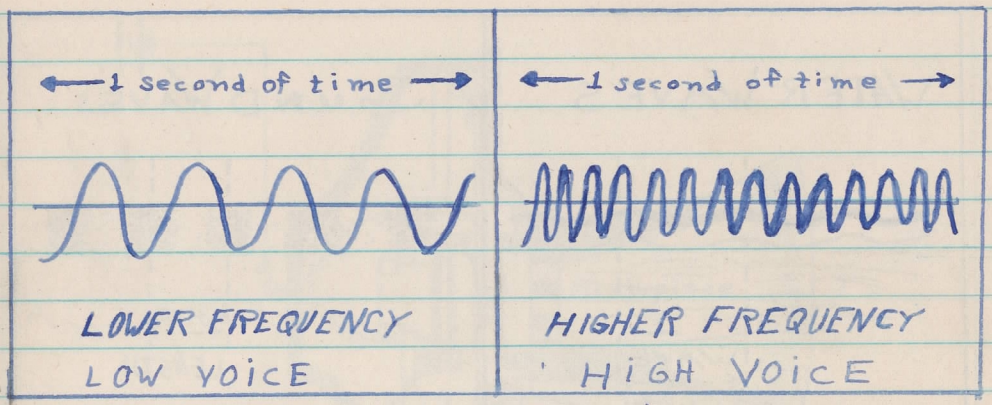
VI How a Wave Moves.
1. There must be something to carry it.

VII What Carries It
1. Solids
2. Steel is the best.
3. Water
4. Air

VIII Rate Of Carriage
1. Air; a little over 1,000 ft. per second.
2. Water; about 5,000 a second.
3. Steel; over 15,000 ft. a second.
4. At a low temperature, it moves slower.

How the Human Makes It.
1. It is made with the vocal cords.
2. Air from the lungs comes through the cords
3. We must stretch them to make them vibrate.

X What Changes the Sound

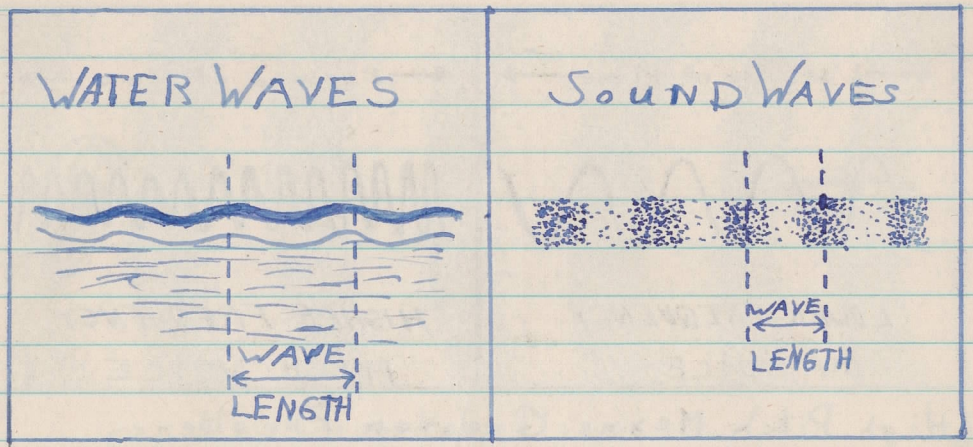


High Pitch Means Greater Frequency

1. Lips.
2. Tongue.
3. Teeth.
4. Shape of mouth and throat.
5. Nose
6. Palate

XI Pitch

1. the rate of vibration.
2. Many make a high voice
3. Slow; deep.

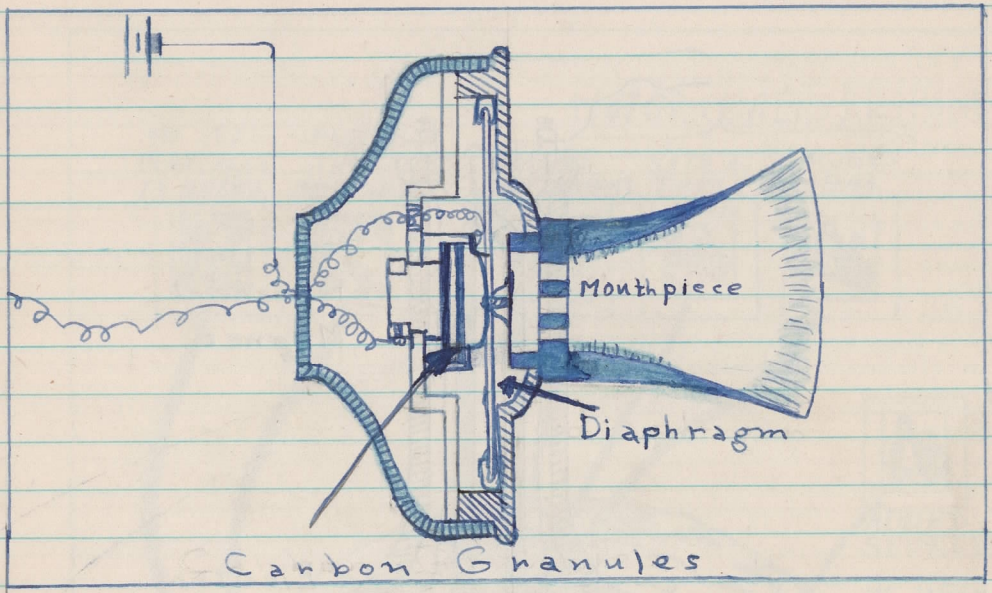


A Comparison Of Sound Waves And Water Waves

WAVES DIFFER AND USES

I How they Differ
1. Loud and soft
2. Loud is high and sharp, a low wave is soft.
3. High and low.
4. This depends on the number of vibrations, high means more
5. Pleasing and noise
6. Pleasing is a regular wave and noise is not

II How they Hit the Ear Drum
1. Loud noises can break it, wave sharp.



The Transmitter

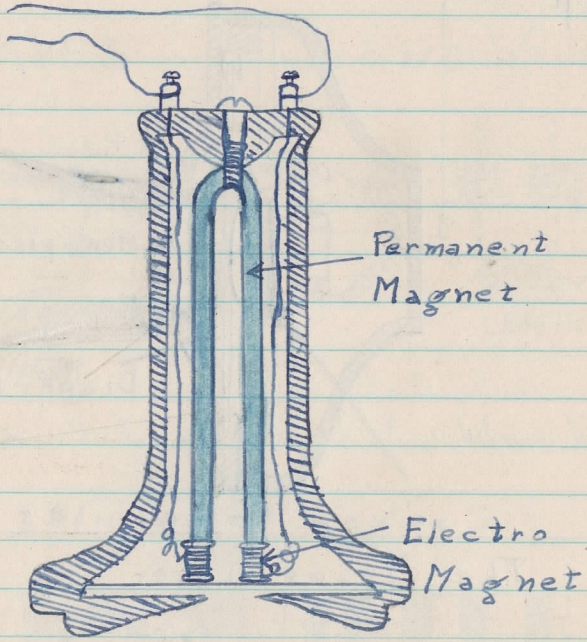
2. Very high, vibrate it too fast.
3. For health we can only stand 50 decibles.
4. Hip is the measure of the numbers of vibrations.

III Number of Vibrations

1. Middle C must have 256 vibrations when in tune.
2. The highest tone is 35,000 vibrations.
3. The lowest tone is 60 vibrations.

IV Over the Wire

1. It is a vibration
2. A diaphram of the telephone sends it.
3. The voice does not go through.
4. It is changed to the voice in the brain.



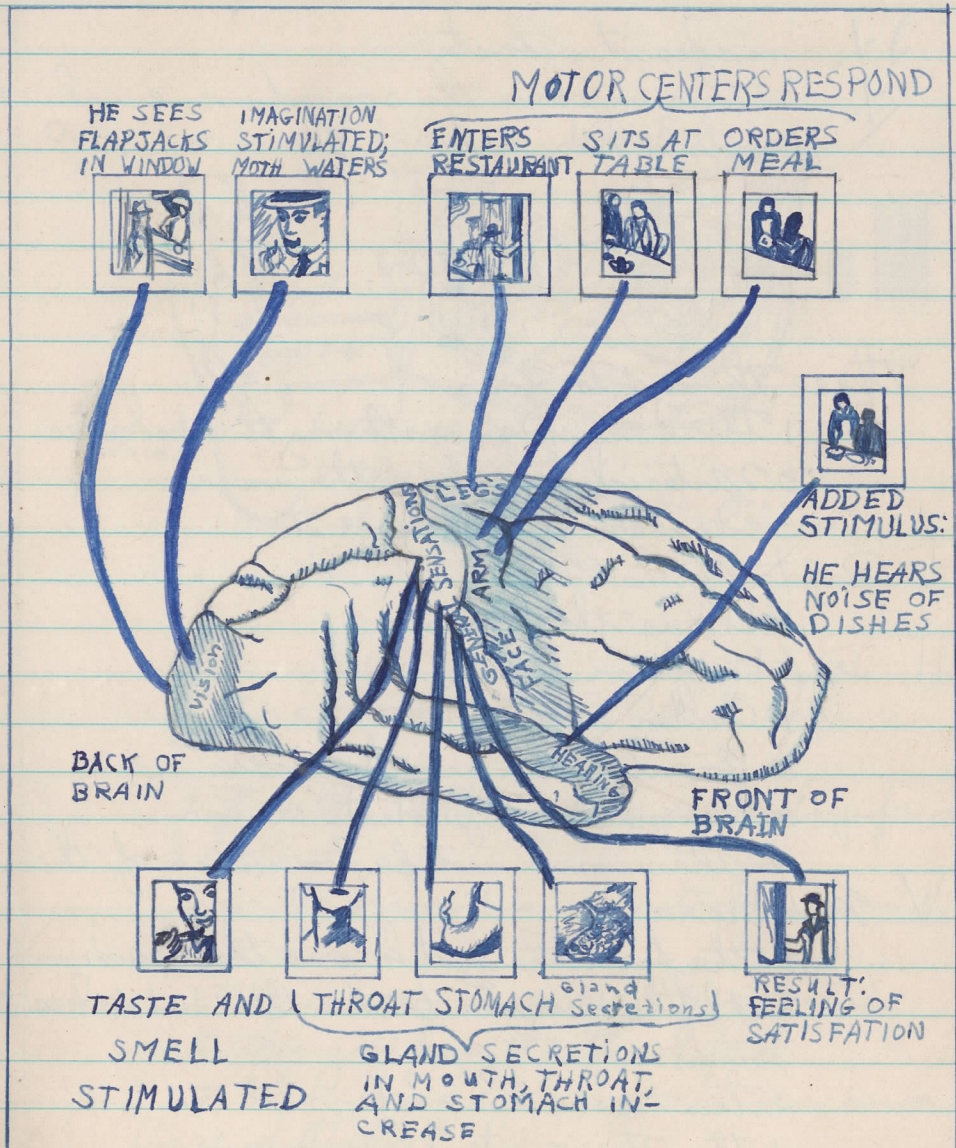
The Receiver

V transmitter

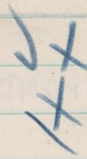
1. Mouthpiece to catch the wave
2. this hits against the 'diaphragm'
3. this causes it to vibrate.
4. Carbon particles are behind this.
5. this presses them together or far apart.
6. these send electric taps over the wire.
7. Your voice does not go.

VI Receiver

1. 6t is a magnet to draw them in.
2. this magnet draws on the diaphragm and



Showing Parts Of The Brain



makes it vibrate.
3. this makes the sound wave which enters her ear

THE EAR

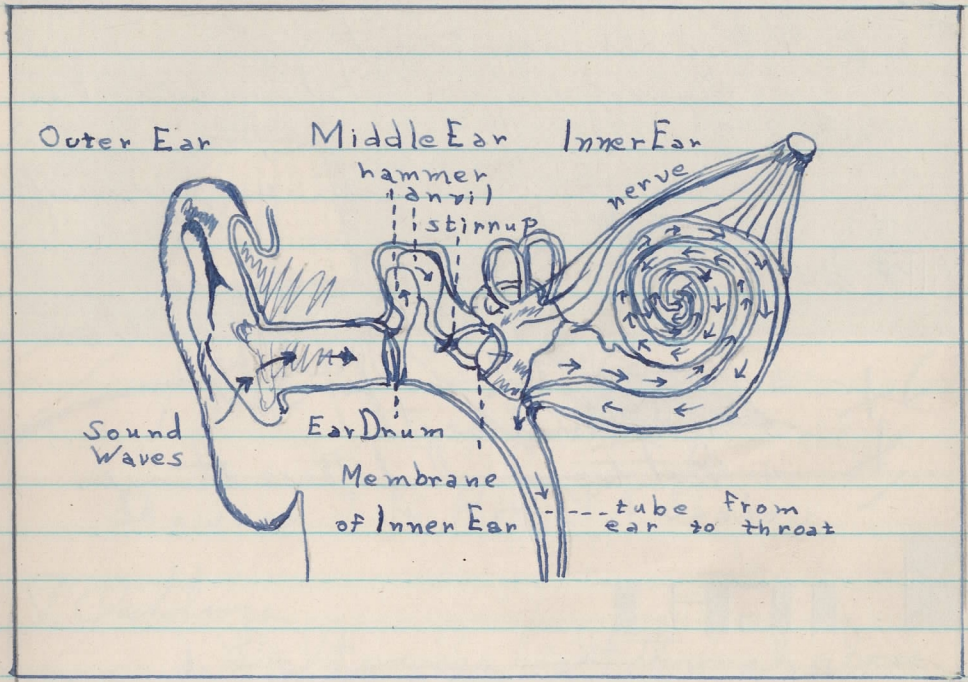
I three things to hear
1. there must be something that vibrates.
2. Material to carry the waves
3. Something to receive it.

II Parts of the Ear
1. It has three parts.

III Parts of ear
1. Outer ear
2. to catch the sound waves.
3. A wax in it protects the ear.
4. there must not be too much of this.

IV Middle ear
1. the first thing it hits is the drum
2. a little hammer touches this and takes the sound.
3. this taps on the anvil.
4. the stirrup gets it from here.

V Inner Ear
1. It is like a snail-shell.
2. the halls of this are filled with a liquid.
3. the liquid takes the wave up.



The Structure of Our Ears

4. From this, little nerves pick it up from the brain.
5. In the brain, it is understood as sound.

VI Air Pressure

1. The inner-ear gets air from a tube.
2. This goes from the throat to it.
3. When going high my ear drum sends out.

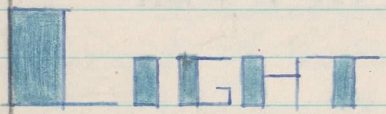
VII Care of the Ear

1. Never slap an ear; this pushes too much air against the drum
2. Never put anything sharp
3. This can be broken when very young & headed.

4. Keep all insects out.
5. Do not allow a lot of wax in it.
6. Do not yell in an ear; too sharp a wave.
7. Cover them when diving; force of water will break it.

VIII Methods Of Preventing Echoes

1. Heavy drapes; they absorb the waves.
2. Composition walls
3. Upholstered seats
4. Not too much of these things.



I To See things

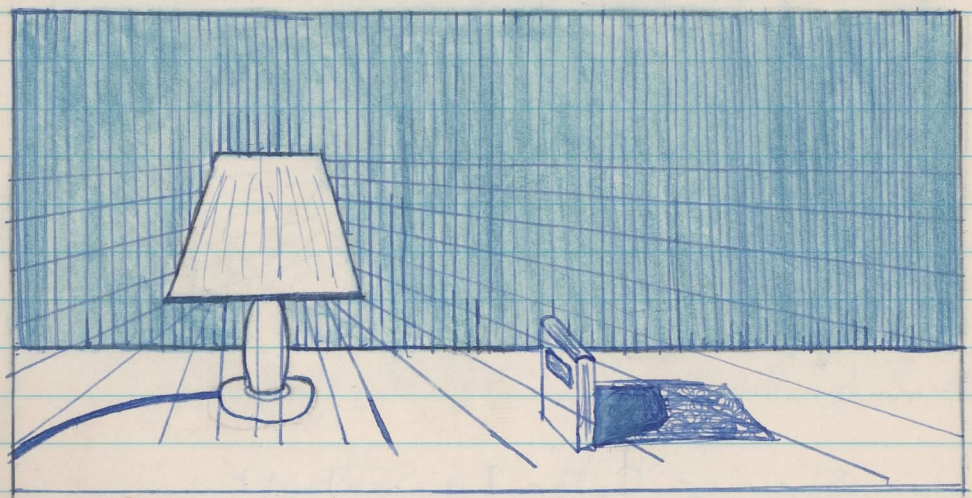
1. Light waves must come to our eyes.
2. There must be something that sends the wave.
3. Something must receive it and turn it to light

II Two Ways to Get the Wave

1. It can come from a heated body directly
2. It can come by reflections
3. Mostly see by reflection
4. Direct is hard on the eye.

III Why Direct Is Hard On the Eye.

1. Direct is strong & straight
2. the reflection of diffused & mixed.

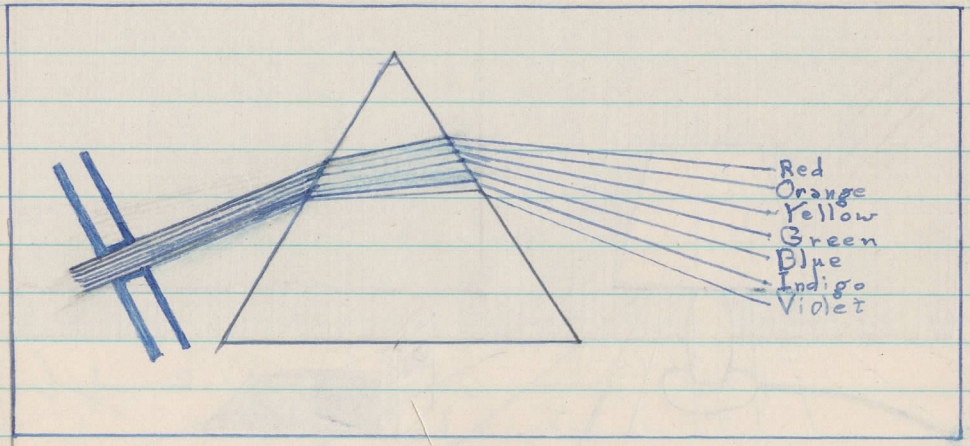


Showing Two Parts Of A Shadow

IV Outdoors
1. Light passes right through glass.

V Different Materials.
1. Opaque; no waves pass through.
2. Wood and metals
3. Transparent; light passes through
4. Glass and cellophane.
5. Translucent.
6. Some waves go through.
7. Paper & frosted glass.

VI Dark and Light Material
1. Black; absorbs all waves.
2. White; all waves reflected.
3. White light is all mixed together.
4. It is dark at night because there are no light waves.



Showing Color In Sunlight

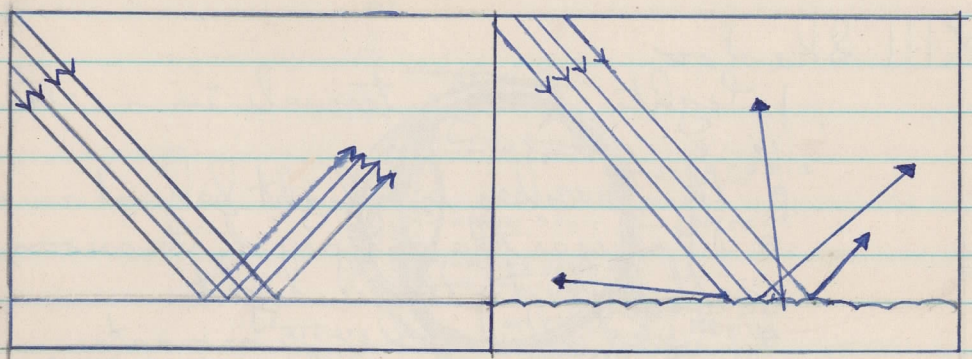
VII What Is Light

1. Energy rays
2. We call it radiant energy
3. It will work for us.

VIII How It Moves.

1. It moves 186 thousand miles a second
2. That is more than 7 times around the world in a second.
3. It goes in a straight line.
4. When it hits, it reflects straight back.
5. It can be changed into different forms of energy.
6. It does not need anything to carry it.

IX Diffused Light



Light Reflecting From Smooth & Rough Surfaces.

1. Scattered light.
2. It is when a direct light hits rough surfaces.
3. It is easier on your eyes.

X Wallpaper

1. Light walls reflect 80%
2. Medium gray 35%
3. Dark brown paper 13%
4. Dark green 5%
5. Black, none

XI All Color

1. It all comes from the sun.
2. They are all waves.
3. Red is longest and strongest.
4. When sent they separate in colors.
5. Violet is the tiniest one.

XII Color Under Artificial Light

1. It is a little different color.
2. It shows less blue in it.

XIII Shadow

1. Lights always travels in a straight line.
2. This makes no light behind an object
3. It causes the eclipse of the moon; the earth reflects the sunlight.
4. Every shadow has two parts.
5. The center is darker; no light gets to it.
6. Dust particles reflect a little into the outer edge of the shadow.

XIV Seeing Around the Corner

1. We cannot see the object unless we can catch the light waves.
2. A light wave never turns a corner; it is always straight.

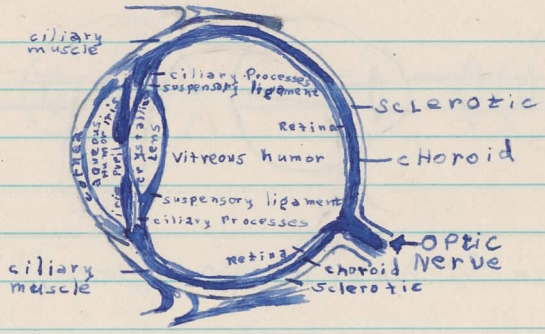
Use And Eye

I Measuring Light

1. It is measured by a foot-candle unit.
2. On a bright day we get 10,000 foot-candles from the sun.

II Eye trouble

1. Most work is indoors.
2. Light is only 20 foot-candle.
3. When the eye is at rest it sees about 20 feet away.



Section Of The Eye.

4. Everything that is closer than that is a strain on the eye.

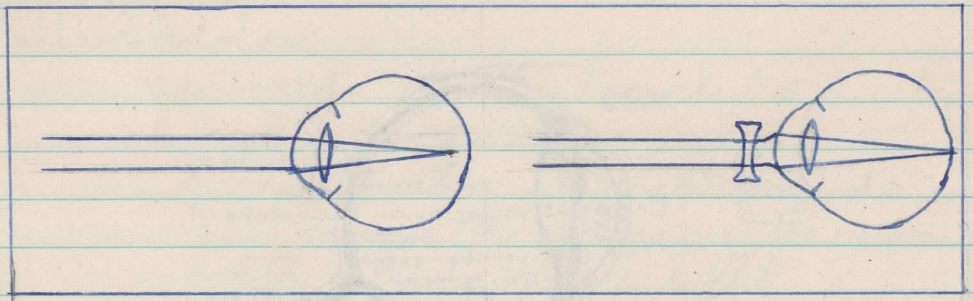
III Lighting A Room.

1. Direct
2. Indirect
3. Semi-direct; best.

IV To Use And Control Light.

1. Our lens.
2. It lies just back of the pupil.
3. When we look at close objects the lens is thick.
4. Far away; lens relax and get thin.
5. It turns the object upside down when passing through the lens.
6. This is because the light wave bends as it goes through the lens.

V Protection of the Eyeball



Cause Of Nearsightedness; correction

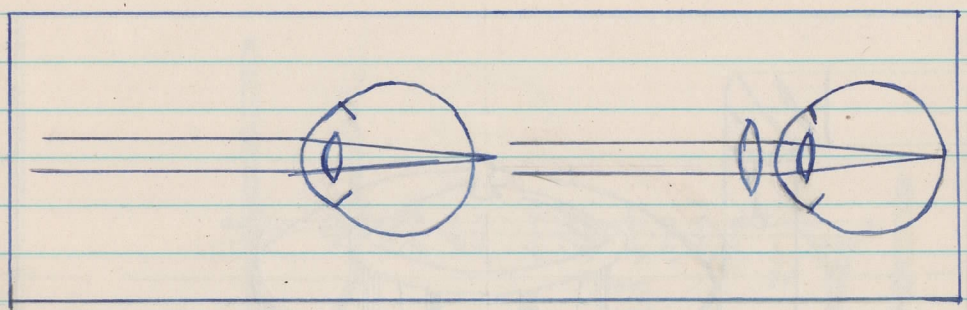
1. Eyelashes
2. Eyelid
3. Bonny socket
4. Eyebrow
5. Liquid

VI Coats Of the Eye

1. It has three coats
2. Sclerotic - coat; the white part.
3. Right in front this is transparent and called cornea.
4. The second one is the choroid coat
5. The color of this varies in different people
6. This shows out at the front of the eye; gives it color
7. This has power to pull and close, controlling light going into the pupil.
8. Retina is the third coat.
9. It is the screen that takes the picture.

VII Inside the Eye

1. Inside is a jelly - like substance



Cause Of Farsightedness; correction

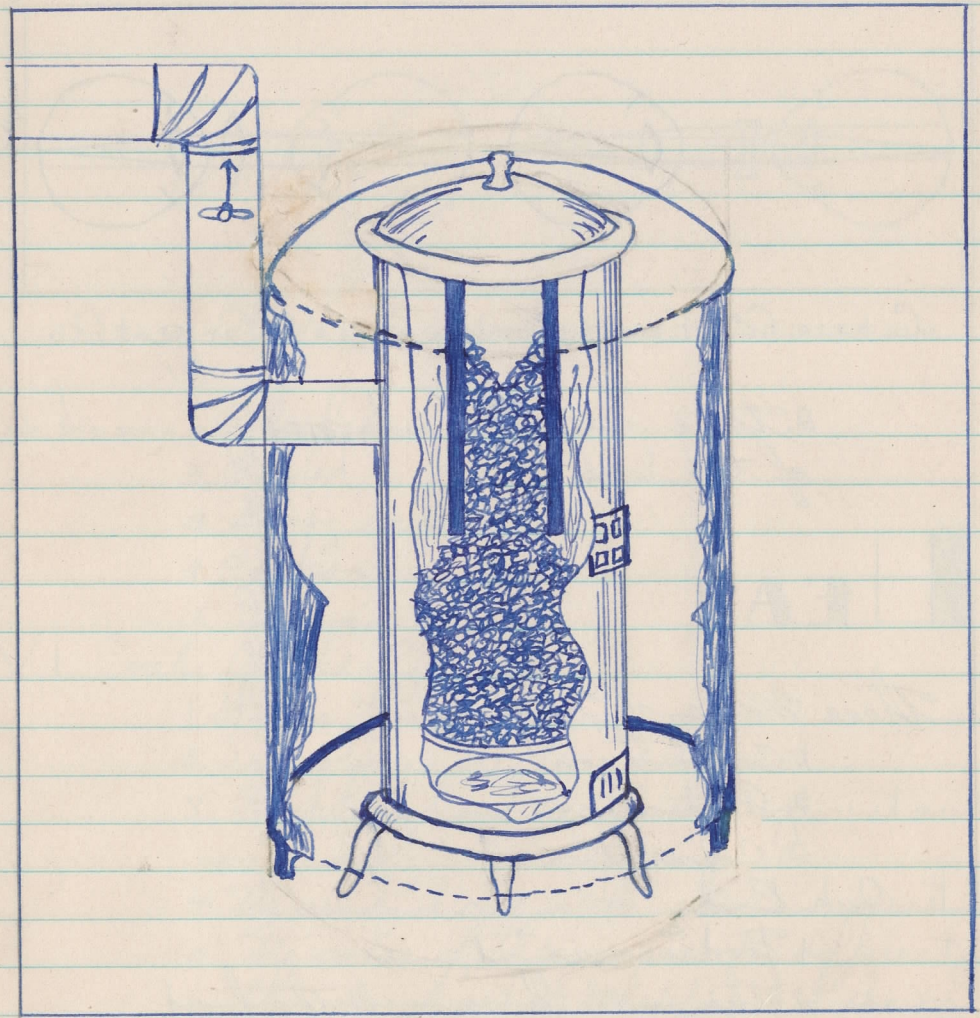
2. there are two kinds; one on each side of the lens.

HEAT

I Three Ways of Heating
1. Convention
2. Radiation
3. Convention

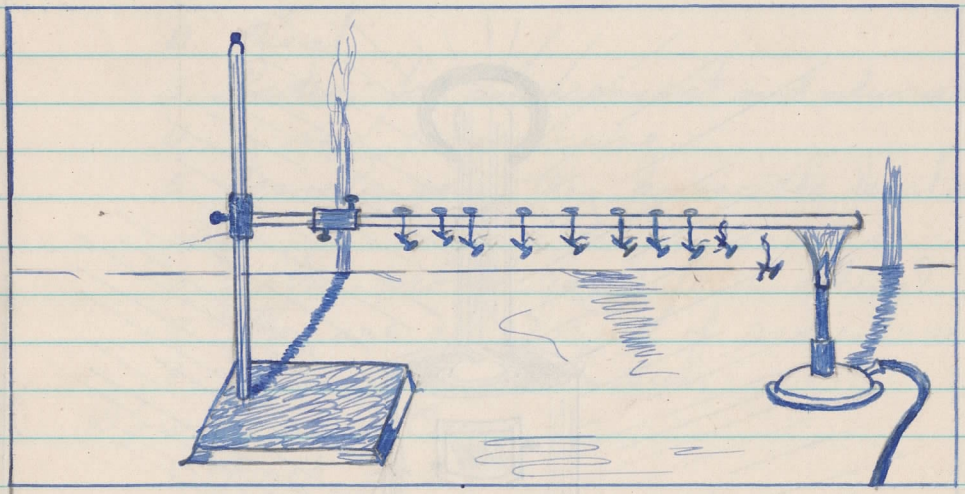
II Our Body
1. Food is oxidized.
2. This is the burning of the food.
3. the oxygen unites with it to burn.
4. the pores in our skin open.
5. Most of it is lost by Radiation.

III Heat Wave
1. It travels at the same rate of light
2. 186,000 miles a second.
3. It can't pass through a vacuum but light



Convection Heats Room

can.
4. It turns to heat when it hits something.
5. It is an electric energy.
6. All kinds of this energy turns to heat.



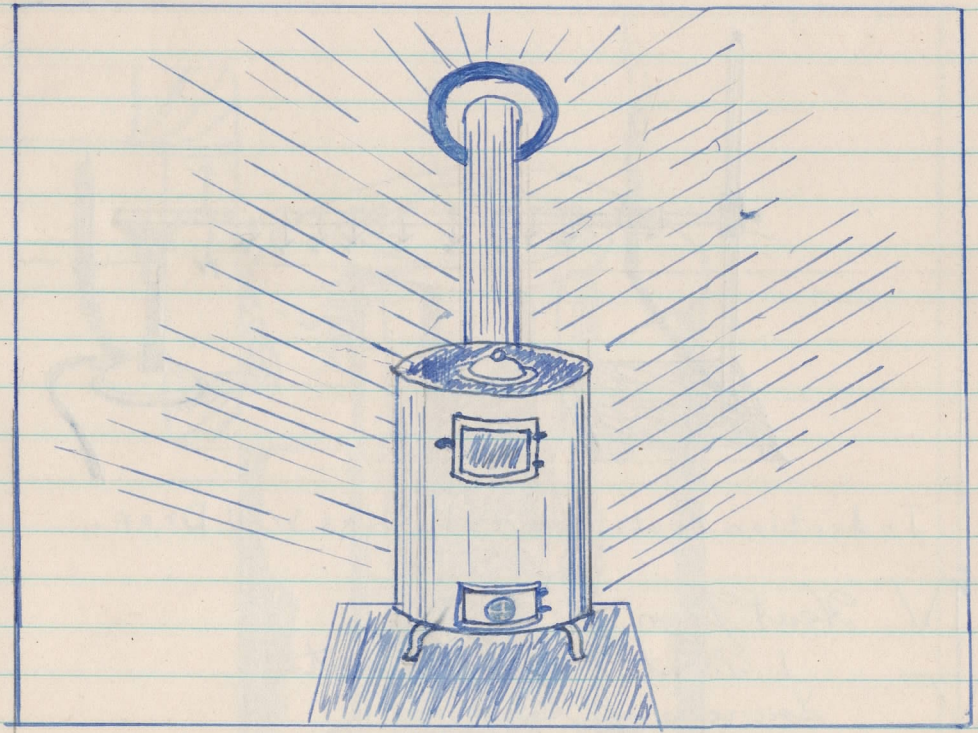
Induction Heats Rod And Tacks Will Drop.

IV Heat From the Sun
1. About 1 two-billionth.

V Sources of Heat
1. Sun
2. Electricity
3. Chemical
4. Friction
5. Burning

VI Materials Warmed
1. they have the different capacity to hold heat.
2. those that absorb it become warm
3. those that reflect it are cool.
4. Some things let it go through.

VII Conduction
1. It is the traveling of heat,



Radiation Will Dry Clothes

2. Good Conduction; as iron, alluminum.
3. Poor Conductor; as air, brick.

VIII Use Of Poor Conductions.

1. For Insulating.
2. Keeps heat from passing.
3. Used in walls of houses.
4. Furnace pipes
5. For holding hot articles.
6. Refrigerators

IX Six Forms Of Radient Energy.

1. Visible light.

2. Heat
3. Radio; for amusement and education.
4. X-ray; medicine.
5. Cosmic rays; they know the least about it.
6. Ultra-violet ray; for medical.
7. They are all forms of radient energy.
8. All come from the sun.

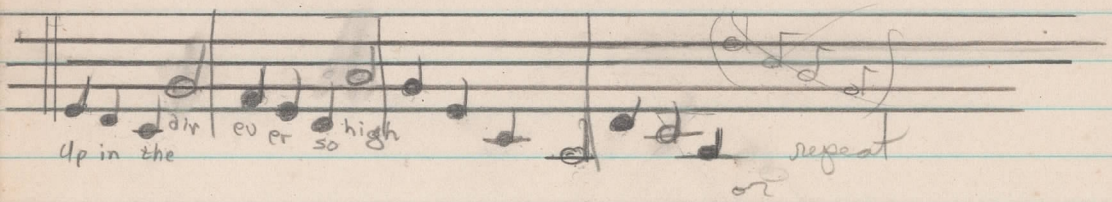
X Power In A Car

1. First, gas.
2. It goes to the carborator
3. Here air is mixed with it in the right amount.
4. From here it goes into the top of the cylinder.
5. The piston, in the cylinder, pulls up.
6. This compresses the gas.
7. Then the spark plug explodes it.
8. This explosion pushes the piston down hard and turns heat into power.
9. The CO^2 that is left goes out the exhaust.

UNIT V

How Are Living Things Improved?

EARLY LIFE


Up in the air
ev er so high
repeat
or